Bellawaddy Priority Area for Action – Desk Study Summary

This is a summary of the desk study for the Bellawaddy Priority Area for Action (PAA), Co. Sligo and Co. Mayo. Desk studies are reports that are prepared by the catchment scientists using available information and data. To write these reports, we use information available for all waters that we plan to assess in the PAA. We get our information from:

- The Environment Protection Agency;
- Local Authorities;
- Inland Fisheries Ireland;
- Irish Water;
- The Department of Agriculture, Food and the Marine; and,
- Other public agencies.

The desk study also includes information learned from the public at a community information meeting specific to the Newport PAA which was held on the 11th November 2019.

In our desk studies, we examine a number of things:

- **quality** – how the water quality has changed since 2007;
- **importance** –for example, if its water is used for drinking water, and if there are any rare plants and animals in it that we need to protect;
- **impacts** from human activity – here we focus on impacts that damage water quality such as discharges from wastewater, agriculture, forestry practices, physical changes to the water etc.

We complete desk studies first before starting our field-based assessments or local catchment assessments (LCAs).

1. Background and location

The Bellawaddy PAA is mainly located in Co. Sligo, adjacent to Killala Bay and the Moy Estuary. Several unmonitored tributaries of the PAA lie within Co. Mayo. The PAA covers an area of approximately 67.5km^2 extending from the townlands of Quignalecka to Carranduff. It includes the Ballymoghany and Bellawaddy rivers (Bellawaddy_020); the Devlin River (Scurmore_010); as well as several small unnamed coastal streams to the north of the PAA (Quigabar_010) and to the south of the PAA (Dooyeghny_Or_Cloonloughan_010) (**Figure 1**). The Bellawaddy River was selected for the PAA because of a deterioration in its water quality and because it discharges to a bathing water at Enniscrone, Co. Sligo, which is an important tourist location for the county. The remaining rivers and streams were selected because there is no existing water quality information available for the water bodies.

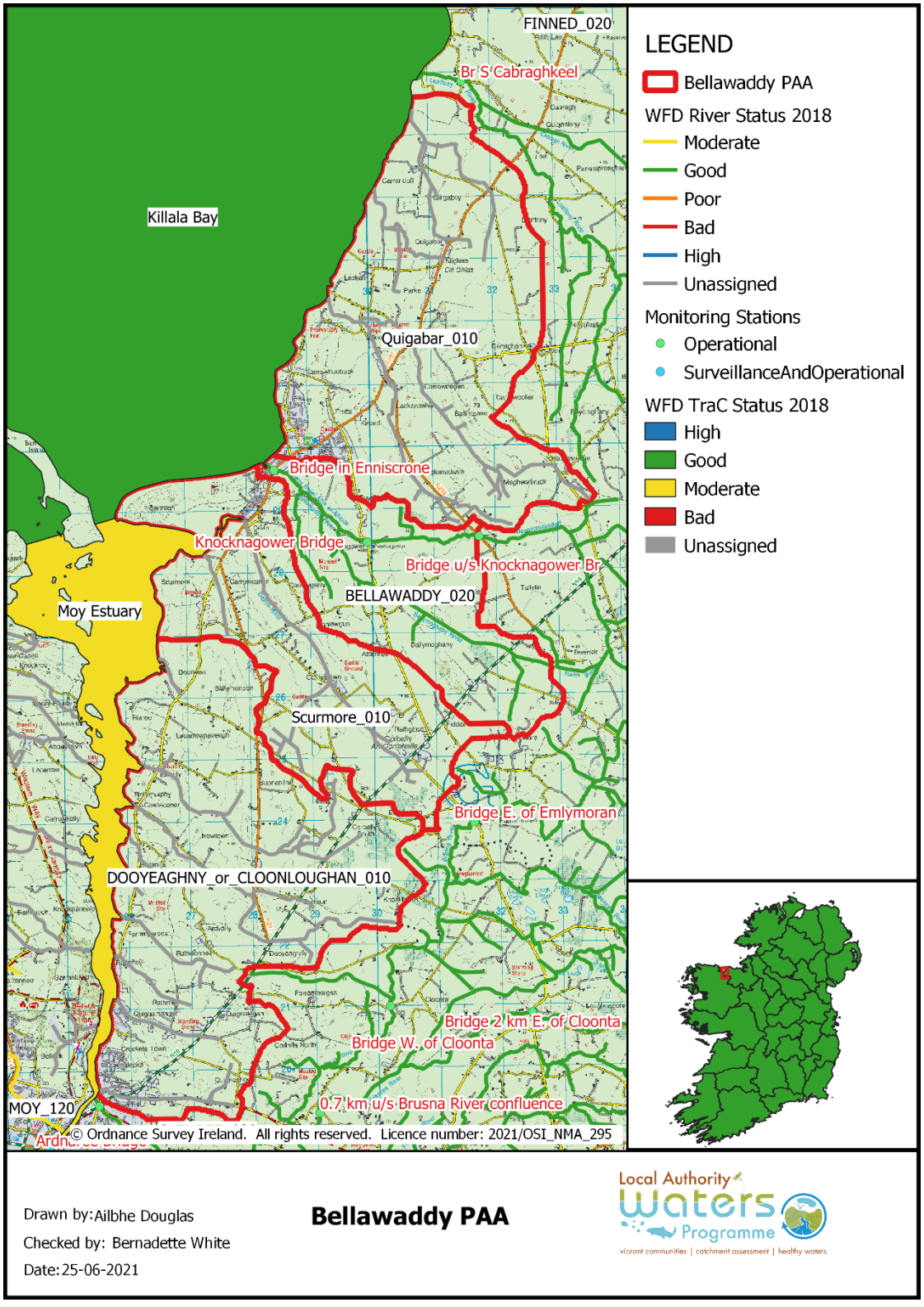

Figure 1: Bellawaddy PAA with Ecological Status

2. Catchment Description

The Bellawaddy PAA forms part of a wider catchment that incorporates several rivers and streams. The larger rivers include the Leaffony River and its tributaries; the Bellawaddy River and its tributaries; and several small unnamed coastal streams. All rivers and streams in the catchment flow into the Moy Estuary or Killala Bay both of which intersect the Killala Bay/ Moy Estuary Special Area of Conservation (SAC) and Special Protected Area (SPA). Both sites are designated for a range of habitats and species. Other protected areas connected to the PAA include the Killala Bay/ Moy Estuary proposed Natural Heritage Area (pNHA), Killala Bay Shellfish Waters and Enniscrone bathing waters.

The water quality of the Enniscrone bathing water was of particular concern based on water quality deterioration in 2010. More recent annual bathing water quality for this beach has indicated that the bathing water is generally classified as 'Good' with only one year in the last seven classified as less than 'Good'.

Land use throughout the PAA is primarily pasture used for grazing cattle. Small pockets of both private and Coillte forestry are present in the PAA. There are two main towns in the PAA, Ballina in Co. Mayo and Enniscrone in Co. Sligo.

3. Water Quality History in the Bellawaddy PAA

Rivers are classified into five quality classes (status), with high being unpolluted and bad being the most polluted.

The EPA assign status at (approximately) 3-yearly intervals based on the standards set out in European legislation, the Water Framework Directive (WFD). Status is based on many different elements that altogether indicate the overall health of the river, for example the ecology recorded in river habitats, the physico-chemical condition of the river (oxygen levels, nutrient concentrations, indicators of organic and chemical pollution etc) and also the physical condition of the river bed and bank or lake shore.

Water quality in the lower Bellawaddy River deteriorated from Good Status in 2007 to Poor Status in 2010. An improvement in water quality was noted in 2013 and the river eventually returned to Good Status in 2016 (**Table 1**). At the time of the deterioration, nutrient pollution (orthophosphate) was identified as the main cause. The activities identified as possible contributors to the nutrient pollution were agriculture and run-off from the urban environment around the Bridge in Enniscrone. Storm water overflows associated with Enniscrone Waste Water Treatment Plant and forestry were also considered in the desk study as possible causes of the deterioration (**Table 1**).

Water quality in the unmonitored rivers and coastal streams of the Quigabar_010, Scurmore_010 and Dooyeghny_Or_Cloonloughan_010 is unassigned i.e. there is a lack of data on the water quality to confirm the condition of the water body (**Table 1**). LAWPRO will collect data through local catchment assessments to determine if these rivers are impacted and to identify the main issue(s) affecting water quality (e.g. nutrients, sediment etc.). At desk study stage, we gathered information on the main activities occurring throughout the river catchment. This will help to inform us of the types of issues we might encounter in unmonitored rivers and stream throughout the catchment (see **Section 4**).

Table 1: Summary of Risk, Ecological Status, Pressures, Significance for the Bellawaddy PAA

Water body Name	Water body Type	Risk	Ecological Status				EPA Characterisation Sig. Pressure Category (Sub-category) (2013-2015	EPA Characterisation Sig. Issue (2013-2015)	Desk Study Review Potential Additional Pressures (2019)	Desk Study Review Potential Sig. Issue (2019)
			2007 -2009	2010 - 2012	2010 - 2015	2013 - 2018				
Bellawaddy_020	River	*At Risk*	Good	Poor	Mod.	Good	Agriculture (Pasture)	Nutrient Pollution	WWTP	Nutrient Pollution
							Urban Run-off (Diffuse Sources Run-off)	Nutrient Pollution	Forestry	Nutrient Pollution Sediment
									Hydromorphology (Channelisation)	Altered hydrology and morphology Sediment
Quigabar_010	River	*Review*	Unassigned				Anthropogenic Pressures (Unknown)	Unknown	DWWTS	Nutrient Pollution
							Agriculture (Pasture) identified as non-significant pressure	Unknown	WWTP	Nutrient Pollution
									Section 4 licences	Nutrient Pollution
Scurmore_010	River	*Review*	Unassigned				Anthropogenic Pressures (Unknown)	Unknown	Hydromorphology (Channelisation)	Altered hydrology and morphology Sediment
							Agriculture (Pasture) and Urban Run-Off (Diffuse Sources Run-Off) identified as non-significant pressures	Unknown	Forestry	Nutrient Pollution Sediment
Dooyeaghny_Or_ Cloonloughan_ 010	River	*Review*	Unassigned				Anthropogenic Pressures (Unknown)	Unknown	Hydromorphology (Channelisation)	Altered hydrology and morphology Sediment
							Agriculture (Pasture) and Urban Run-Off (Diffuse Source Run-Off) identified as non-significant pressures	Unknown	DWWTS	Nutrient Pollution
									Forestry	Nutrient Pollution Sediment

4. Sources of Pollution

Pollutants find their way to rivers by a number of paths:

- They can be piped directly to the river from large sources such as wastewater treatment plants, or small sources such as faulty septic tanks, farmyards, roadside drains etc.
- They can flow across the ground to the river when nutrients which are applied to the land as fertiliser are washed off by rainfall before the crop and soil has absorbed them. This is usually a problem where soils are wetter and poorly draining, particularly during wet weather.
- Groundwater losses occur when pollutants move down through the soil and rock into groundwater and eventually into rivers, lakes and coastal waters. This usually occurs when too much fertiliser is applied to land, or when the soil isn't ready to absorb the nutrient (e.g. temperatures too cold, incorrect soil pH etc) and is common in free-draining/ light soils.

Agriculture was identified as a significant source of nutrient pollution on the lower Bellawaddy River. It was also identified as a possible source of pollution on the unassigned rivers and coastal streams in the PAA. Pasture accounts for 85% of the agricultural crop type in the PAA. The soil type is predominantly well drained, however there are some areas of peat soils in the upper Bellawaddy which will be at higher risk of phosphorus loss, particularly in the Bellawaddy_010.

Diffuse urban run-off was also identified as a significant source of nutrient pollution in the lower Bellawaddy River and as a possible source of pollution in the unassigned rivers and coastal streams of the Scurmore_010 and Dooyeaghny_Or_Cloonloughan_010. Enniscrone is the main urban area within the Bellawaddy_020 and Scurmore_010 and Ballina town is the main urban area in the Dooyeaghny_Or_Cloonloughan_010.

Hydromorphology is not listed as a significant pressure in this PAA however the unassigned Scurmore_010 and Dooyeahny_Or_Cloonloughan_010 are part of the Ballina and Environs OPW Area for Action as part of flood relief works and the OPW Moy Arterial Drainage Scheme. Under the arterial drainage scheme, river channels are maintained on a 4 to 5-year cycle.

Domestic Waste Water Treatment Systems (e.g. septic tanks) are not listed as a significant pollution source in this PAA however there are a number of DWWTS in the Quigabar_010 and Dooyeahny_Or_Cloonloughan_010 that may pose a risk to water quality. The areas where DWWTS are of most concern are areas where the systems are situated on karst limestone along the river channels. The main risks from domestic wastewater arises from existing systems where the site was not suitability assessed or designed correctly or from treatment systems that are not adequately maintained under a maintenance contract or regularly de-sludged. Untreated domestic wastewater can lead to water pollution, risk to public health and to degradation of habitats and ecosystem heath where inadequately treated effluent is piped to streams, flows via overland flow or shallow groundwater flow to streams where percolation is inadequate or by entering groundwater. The main pollutants are microbial pathogens (e.g. *E. coli*); orthophosphate and, nitrogen.

5. Next Steps

Community Engagement Meeting

We held a community information meeting about the Bellawaddy PAA in the Diamond Coast Hotel, Enniscrone, Co. Sligo, on the 11th November 2019, to tell the public about our work and to hear about water quality concerns from people living in the area. The meeting was attended by members of the public and local stakeholders including business owners and community groups. The meeting involved two presentations by LAWPRO followed by a Q&A session with the attendees. The main topics raised by the attendees were: loss of Blue Flag and failure to reinstate it; forecasting system required to inform bathers of possible health risks; and the potential development of *E. coli* PIP maps for critical source areas in Bellawaddy catchment.

Farmers Meetings

The Agricultural Sustainability Support and Advisory Programme (ASSAP) advisors from Teagasc held an information meeting for farmers within the PAA on 09th March 2020. The meeting was attended by farmers located in the PAA and it involved presentations from the ASSAP advisors and LAWPRO Catchment Scientist followed by a Q&A session with the attendees.

6. Local Catchment Assessment

To confirm the current condition of water quality in the Bellawaddy River, and to identify any water quality issues in the unassigned rivers: Quigabar_010, Scurmore_010 and the Dooyeaghny_Or_Cloonloughan_010, we will start our local catchment assessments in the PAA in 2020. The LCAs will involve the sampling of biology (macroinvertebrates and vegetation) and chemistry (orthophosphate, ammonia and nitrogen) at sites along the rivers as well as catchment walks. The dissolved oxygen, pH, temperature and conductivity will be measured at each site also. If water quality in the lower Bellawaddy River has deteriorated from its current Good Status, we will aim to confirm the main sources of pollution. If agricultural activity is confirmed as a source of pollution, LAWPRO will communicate the LCA findings to the ASSAP advisor for the area who will work closely with farmers providing them with a free and confidential advice to address the activity. In the case of other activities causing water quality issues, LAWPRO will work with the relevant organisation(s) to address the issue, for example Sligo County Council in the case of urban run-off issues etc. For the unassigned rivers, we will communicate our findings on the condition of these rivers to the EPA.

Figure 2: Bellawaddy River from the Bridge in Louisburgh